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Introduction of the Definition, Abbreviations and Measurement Conventions Appendix A in ED 73C

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Summary

The chapter 1.5 of ED 73B will be an appendix in ED 73 C, to harmonize with RTCA appendix organization.

Appendix A

Definitions, Abbreviations and Measurement Conventions

A.1 Mandating and Recommendation Phrases

a. "Shall"

The use of the word SHALL indicates a mandated criterion; ie compliance with the particular procedure or specification is mandatory and no alternative may be applied.

b. "Should"

The use of the word SHOULD (and phrases such as "IT IS RECOMMENDED THAT ...", etc.) indicate that though the procedure or criterion is regarded as the preferred option, alternative procedures, specifications or criteria may be applied, provided that the manufacturer, installer or tester can provide information or data to adequately support and justify the alternative.

A.2 Definitions

Algorithm - A set of well-defined rules for the solution of a problem in a finite number of steps.

Burst - A series of interrogations.

Cancellation - This is a protocol used by the ADLP to cancel downlink messages that are queued in the transponder awaiting extraction by the Mode S ground system.

Closeout - This is a protocol that confirms to a transponder that Comm-B, Comm-C (ELM) or Comm-D (ELM) transactions have been successfully completed and must be cleared from the transponder.

Desensitisation - Temporary reduction of transponder sensitivity after receipt of a signal. Used to reduce echo (multipath) effects.

Diversity - A method of selecting the reply transmission path based on the relative amplitude of the received interrogation signal from two or more channels with independent antennas.

Downlink - A signal propagated from the transponder.

Dynamic Range - The ratio between the overload level and the minimum triggering level in a transponder.

Field - A group of bits in a message treated as a single unit of information.

Framing Pulse - One of the two pulses F_1 and F_2 spaced a nominal 20.3 μs apart which bracket a reply to Mode A and Mode C interrogations.

Format - The specific order in which fields of information appear in a Mode S digital message transmission.

Lockout - This is a protocol which provides a means of preventing a Mode S transponder from replying to 'All-Call' interrogations. See ICAO Annex 10 para 3.1.2.6.9 for full information.

Message - An arbitrary amount of information whose beginning and end are defined or implied.

Minimum Triggering Level (MTL) - The minimum input power level that results in a 90% reply ratio in the Mode A/C format or 99% in the Mode S format if the interrogation signal has all nominal spacings and widths and if the replies are the correct replies assigned to the interrogation format.

Mode A/C - For the purpose of this document, Mode A/C is taken as referring to non-Mode S transactions. Where specific Mode A or Mode C transactions are involved, these are identified individually.

NOTE: *The US term for non-Mode S SSR is ATCRBS (Air Traffic Control Radar Beacon System). It is not used in this document.*

Monopulse - A radar system using a receiving antenna having two or more partially overlapping lobes in the radiation pattern. Sum and difference channels in the receiver compare the amplitudes or phases of the received signal to interpolate azimuth measurement within the radar beam.

Multipath - The propagation phenomenon that results in signals reaching the receiving antenna by two or more paths, generally with a time or phase difference.

ONE(s) - The affirmative value(s) of a binary bit.

Power Off Condition – The condition in which the transponder electrical power is not applied to the receiver, transmitter or related components.

Protocol - A set of conventions between communicating processes on the formats and contents of messages to be exchanged.

Reply Radio - The ratio of a number of replies to the number of interrogations that should cause a reply to be generated.

Side Lobe Suppression (SLS) - A technique to prevent responses from transponders not in the main beam of the interrogating antenna.

Special Position Identification (SPI) - A special pulse used in Mode A/C replies located 4.35 µs following the second framing pulse. When used with Mode S, SPI appears as a code in the flight status (FS) field.

Squitter - The transmission of a specified reply format at a minimum rate without the need to be interrogated.

Standby State – The condition in which transponder electrical power may be applied to the receiver, transmitter and related components but the transponder is disabled from transmitting. In this state the transponder does not reply to interrogations and does not squitter any information in any Mode A/C/S format.

Transaction - The process of accepting and processing an interrogation and generating a corresponding reply.

Uplink - Signal propagated toward a transponder.

ZERO(s) - The negative value(s) of a binary bit.

NOTE: *Definitions of Mode S coding formats, protocols and interfaces are contained in ICAO Annex 10.*

A.3 Abbreviations

AA	Address Announced
AC	Altitude Code
ACAS	Airborne Collision Avoidance System
ACS	Altitude Code Subfield
ADLP	Aircraft Data Link Processor
ADS	Comm-A Definition Subfield
AICB	Air Initiated Comm-B
AIS	Aircraft Identification Subfield
AP	Address Parity
AQ	Acquisition Special
ARA	Active Resolution Advisory
ASA	Airborne Separation Assurance
ATCRBS	Air Traffic Control Radar Beacon System
ATM	Air Traffic Management
ATS	Altitude Type Subfield
BCS	Comm-B Capability Subfield
BDS	Comm-B Data Selector Code
CA	Capability
CC	Crosslink Capability
CDS	C - Definition Subfield
CFS	Continuation Subfield
CL	Code Label
DDS	D - Definition Subfield
DELM	Downlink Extended Long Messages
DF	Downlink Format
DI	Designation Identification
DME	Distance Measuring Equipment
DPSK	Differential Phase Shift Keying
DR	Downlink Request
DS	Data Selector
ECS	Extended Capability Subfield
ELM	Extended Length Message
FIFO	First In First Out
FS	Flight Status
GICB	Ground Initiated Comm-B
I	Inquiry Mode
IC	Interrogator Code
ID	Identification (4096 code)
IDS	Identification Designation Subfield
II	Interrogator Identification
IIS	Interrogator Identification Subfield
ILS	Instrument Landing System
KE	Control ELM
LOS	Lockout Subfield
LSS	Lockout Surveillance Subfield
MA	Message Field In Comm-A
MB	Message Field In Comm-B

MBS	Multisite Comm-B Subfield
MC	Message Field in Comm-C
MD	Message Field in Comm-D
ME	Message Extended Squitter
MES	Multisite ELM Subfield
MSB	Most Significant Bit
MTE	Multiple Threat Encounter
MTL	Minimum Triggering Level
MU	Message Field in Comm-U
MV	Message Field in Comm-V
N	Number of transitions at “ 1 ” in DPSK modulation
NC	Number of C segments
ND	Number of D segments
PAM	Pulse Amplitude Modulation
PC	Protocol
PI	Priority/Interrogator Identity
PR	Probability of Reply
RAC	Resolution Advisory Complement
RAI	Resolution Advisory Indicator
RAT	Resolution Advisory Terminated Indicator
RC	Reply Control
RCS	Rate Control Subfield
RF	Radio Frequency
RI	Reply Information
RL	Reply Length
RR	Reply Request
RRS	Reply Request Subfield in SD
RSS	Reservation Status Subfield
SARPS	Standards and Recommended Practices
SAS	Surface Antenna Subfield
SD	Special Designation
SI	Surveillance Identifier
SICASP	SSR Improvements and Collision Avoidance Systems Panel
SIS	Surveillance Identifier Subfield
SL	Sensitivity Level
SLC	Sensitivity Level Control
SLS	Side Lobe Suppression
SPI	Special Position Identification
SRS	Segment Request Subfield
SSR	Secondary Surveillance Radar
TAS	Transmission Acknowledgement Subfield
TCS	Type Control Subfield
TID	Threat Identity Data
TIDA	Threat Identity Data, Altitude
TIDB	Threat Identity Data, Bearing
TIDR	Threat Identity Data, Range
TMS	Tactical Message Subfield
TRS	Transmission Rate Subfield
TTI	Threat Type Indicator
UDS	U-Definition Subfield
UELM	Uplink Extended Length Message

UF	Uplink Format
UM	Utility Message
VDS	V-Definition Subfield
VS	Vertical Status
VSWR	Voltage Standing Wave Ratio

A.4 Measurement Conventions

The following measurement conventions apply to the signal and pulse characteristics defined in paragraph **Error! Reference source not found.**.

PULSE AMPLITUDE - Defined as the peak voltage amplitude of the pulse envelope.

PULSE DURATION - Measured between the half voltage points of the leading and trailing edges.

PULSE RISE TIME - Measured as the time interval between 10% and 90% of peak amplitude on the leading edge of the pulse.

PULSE DECAY TIME - Measured as the time interval between 90% and 10% of peak amplitude on the trailing edge of the pulse.

PULSE-TO-PULSE INTERVALS - Measured between the half voltage points of the leading edges of consecutive pulses.

PHASE REVERSAL LOCATION - Measured at the 90° point of the phase transition.

PHASE REVERSAL DURATION - Measured between the 10° and 170° points of the transition.

PHASE REVERSAL INTERVALS - Measured between 90° points of the transitions.